

CLAIMS

1. (original) A discharge lamp having a reflector and cooling means, which cooling means has at least one nozzle (3; 31, 32, 33, 34) through which a flow of gas can be directed onto the discharge lamp, wherein the at least one nozzle (3; 31, 32, 33, 34) is arranged such that it does not extend, at least to any substantial degree, into a beam path produced by the lamp (2) and the reflector (1).

1 2. (original) A discharge lamp as claimed in claim 1, wherein the at least one nozzle
2 (3; 31, 32, 33, 34) is inserted in a hole in the reflector (1).

1 3. (previously presented) A discharge lamp as claimed in claim 1, wherein a
2 velocity of the flow of gas emerging from the at least one nozzle (3, 31, 32, 33, 34) is of a value
3 such that a turbulent flow is produced that surrounds at least part of the lamp (2).

1 4. (original) A discharge lamp as claimed in claim 1, wherein at least two nozzles
2 (31, 32; 33, 34) that are at an angle to one another are directed at the discharge lamp (2) such that
3 a turbulent flow is produced that surrounds at least part of the lamp (2).

1 5. (original) A discharge lamp as claimed in claim 4, wherein the nozzles (31, 32;
2 33, 34) are at an angle of approximately 90° to one another.

1 6. (previously presented) A discharge lamp having a reflector and cooling means,
2 which cooling means has at least one nozzle (3; 31, 32, 33, 34) through which a flow of gas can

CLAIMS

3 be directed onto the discharge lamp, wherein the at least one nozzle (3; 31, 32, 33, 34) is
4 arranged such that it does not extend, at least to any substantial degree, into a beam path
5 produced by the lamp (2) and the reflector (1),

6 wherein a first sensor (41) is arranged adjacent at least one of the nozzles (3; 31,
7 32, 33, 34) to sense the velocity and/or the pressure and/or the flow-rate of a flow of gas passing
8 through the nozzle (3; 31, 32, 33, 34).

1 7. (previously presented) A discharge lamp as claimed in claim 1, wherein at
2 least one first nozzle (31, 32) is directed at a region of a discharge vessel (21) that is at the top in
3 the position in which the discharge lamp (2) is operating, and at least one second nozzle (33, 34)
4 is directed at a region of the discharge vessel (21) that is at the bottom in this same operating
5 position.

1 8. (previously presented) A discharge lamp as claimed in claim 7, wherein a velocity
2 of the flow of gas passing through at least one of the nozzles (3; 31, 32, 33, 34) can be controlled
3 as a function of the operating position of the discharge lamp (2).

1 9. (previously presented) A discharge lamp having a reflector and cooling means,
2 which cooling means has at least one nozzle (3; 31, 32, 33, 34) through which a flow of gas can
3 be directed onto the discharge lamp, wherein the at least one nozzle (3; 31, 32, 33, 34) is
4 arranged such that it does not extend, at least to any substantial degree, into a beam path
5 produced by the lamp (2) and the reflector (1).

CLAIMS

6 wherein at least one first nozzle (31, 32) is directed at a region of a discharge
7 vessel (21) that is at the top in the position in which the discharge lamp (2) is operating, and at
8 least one second nozzle (33, 34) is directed at a region of the discharge vessel (21) that is at the
9 bottom in this same operating position,

10 wherein a second sensor (12) is provided to sense the operating position of the
11 discharge lamp (2) and to control the velocity of the flow of gas passing through at least one of
12 the nozzles (3; 31, 32, 33, 34) as a function of the operating position.

1 10. (previously presented) A discharge lamp comprising
2 - a discharge element;
3 - a reflector about the discharge element for producing a beam path toward an exit
4 window;
5 - cooling means, comprising at least one nozzle arranged at the exterior of the reflector and
6 having an opening at the boundary of the reflector inside the lamp, the nozzle pointing
7 toward the discharge element, but not parallel to an axis of symmetry created by the
8 discharge element and a neck of the reflector.

1 11. (previously presented) The lamp of claim 10 comprising at least one second nozzle, also
2 having an opening at the boundary of the reflector inside the lamp, pointing toward the discharge
3 element, but not parallel to the axis, the second nozzle forming an angle with respect to the first
4 nozzle such that a turbulent flow is produced around the discharge element.

CLAIMS

1 12. (previously presented) The lamp of claim 10, wherein the nozzle is arranged perpendicularly
2 to the beam path.

1 13. (previously presented) The lamp of claim 10, comprising at least first and second nozzles
2 arranged approximately opposite each other across the axis.

1 14. (previously presented) The lamp of claim 10, wherein the nozzle is arranged near the exit
2 window and pointing back approximately toward a neck of the reflector.

15. (previously presented) The lamp of claim 10, wherein the nozzle is not arranged in a neck of
the reflector.

1 16. (previously presented) A discharge lamp comprising
2 • a reflector;
3 • a discharge vessel for emitting light onto the reflector, thereby creating a beam path;
4 • cooling means for adequately cooling an upper region of the lamp, while a bottom region is
5 not too severely cooled, in a position independent fashion, the cooling means comprising
6 ○ at least first and second independently controllable nozzles for directing a flow of
7 gas into the lamp, the nozzles being arranged such that they do not extend, at least to any
8 substantial degree, into the beam path, and so that an upper region of the lamp is adequately
9 cooled, while a bottom region is not too severely cooled;
10 ○ at least one first sensor for measuring a cooling effect of the nozzles; and

CLAIMS

11 ○ at least one second sensor for detecting an operation position of the lamp.

1 17. (previously presented) A discharge lamp having a discharge element, a reflector and cooling
2 means, which cooling means includes at least one nozzle through which a flow of gas can be
3 directed onto the discharge lamp, wherein the at least one nozzle is arranged such that neither the
4 nozzle nor an opening in the reflector accommodating the nozzle substantially reduces an
5 amount of light in a beam path produced by the element and the reflector.

18. (previously presented) The discharge lamp of claim 3, wherein the flow of gas is not pulsed.

19. (previously presented) The discharge lamp of claim 8, wherein control of the flow as a
function of position occurs automatically responsive to sensed position.

20. (previously presented) The discharge lamp of claim 7, wherein the flow is adapted for non-uniform cooling so that a top portion of the discharge vessel is cooled more than a bottom portion.

1 21. (withdrawn) A method for cooling a discharge lamp, the lamp including a discharge element
2 and a reflector disposed around the element, the method comprising automatically performing
3 the following:
4 • directing at least one flow of gas onto the discharge element;
5 • sensing a position of the lamp and the flow of gas; and

CLAIMS

- altering the flow based on the position.

¹ 22. (withdrawn) The method of claim 21, wherein

- 2 • the at least one flow of gas comprises at least first and second flows of gas from
- 3 respective distinct first and second openings in a boundary of the reflector; and
- 4 • altering the flow comprises independently controlling at least the first and second flows
- 5 responsive to the position, so that one of the flows that is more substantially directed to a
- 6 top of the discharge element is stronger than another of the flows that is more
- 7 substantially directed to a bottom of the discharge element.

23. (withdrawn) The method of claim 22, wherein altering the flow comprises turning off at least one of the flows, when that flow is substantially directed at a bottom of the discharge element.

1 24. (withdrawn) The method of claim 21, wherein the reflector includes a neck portion for
2 securing the discharge element, each flow is directed onto the discharge element from a
3 respective opening in the reflector spaced away from the neck, each respective opening being
4 placed and sized so that it does not significantly reduce light output from the lamp.

25. (new) The lamp of claim 1, wherein no part of the cooling means is located inside a cavity formed by the reflector.